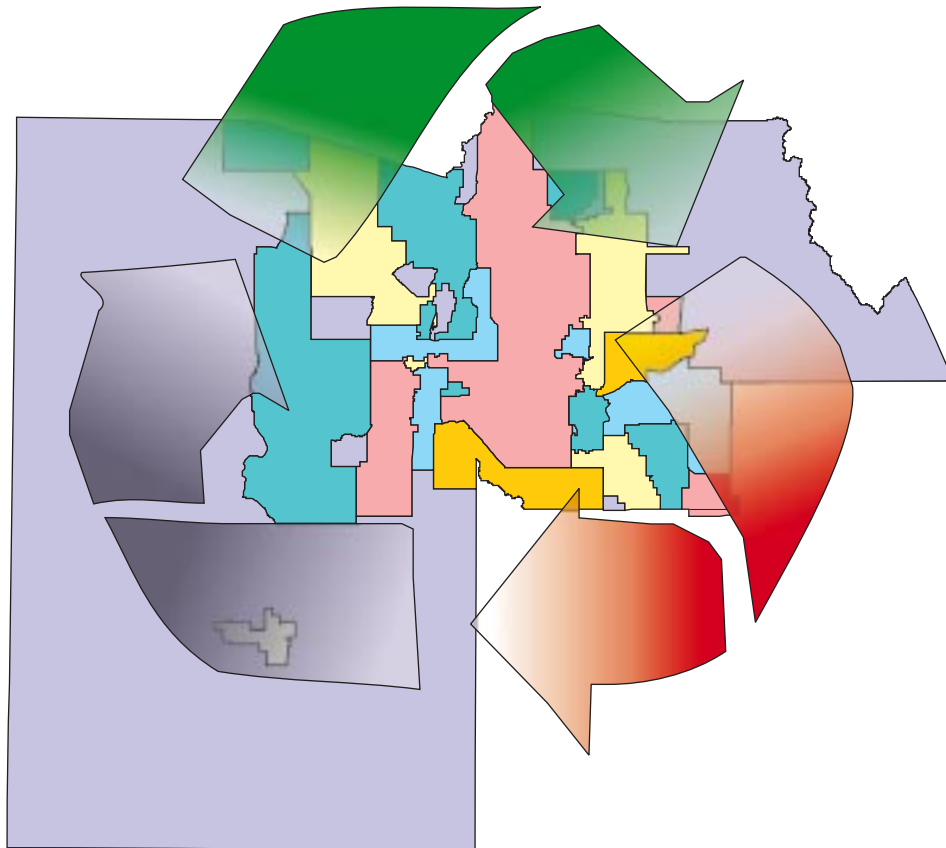


REGIONAL RECYCLING INFORMATION EXCHANGE CASE SCENARIOS



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INTRODUCTION

The recycling programs in the Maricopa Association of Governments (MAG) region vary from sophisticated curbside programs to programs that are struggling to find the funds and expertise to exist. Currently, there are six communities that have permanent curbside recycling programs and a few more communities that are in the process of establishing curbside programs. As the interest in recycling programs grows, communities will be increasingly looking for opportunities to establish and maintain the most cost effective and efficient programs. The jurisdictions in the MAG region have expressed a need to obtain and analyze data in individual jurisdictions and on a regional basis to better enable them to establish or improve their programs. The Solid Waste Information Management System (SWIMS) is a tool that allows communities to fulfill their solid waste management informational needs. The system and several case scenarios are presented in this document to demonstrate the opportunities available to MAG member agencies.

SOLID WASTE INFORMATION MANAGEMENT SYSTEM (SWIMS)

The Solid Waste Information Management System (SWIMS) database is an overall planning instrument that incorporates socioeconomic, waste generation, waste disposal and recycling assumptions about the MAG region and the individual municipalities. The database has the capability to calculate past trends, current activities and also make predictions about the future based on scenarios that are practical and realistic. SWIMS was originally developed using data from 1989. The database was recently updated using information collected through the 1998 MAG Solid Waste Information Collection Effort and the Arizona Department of Environmental Quality 1997 Annual Waste Reduction and Recycling Survey. National data was utilized when information was not otherwise available.

SWIMS is a unique system for several reasons. First, it analyzes waste by class. The classification system was developed to be compatible with locally collected waste stream data and local planning needs. Secondly, it can analyze waste for each individual jurisdiction which allows for an accommodation of the unique nature of each specific program. This is especially important since the region has such a diverse array of programs and circumstances. It is necessary to make assumptions in the model in order to calculate the scenarios. These assumptions can be altered to reflect changes in planning factors and to develop alternate scenarios. Constant effort to acquire, collect and maintain data in the SWIMS database will ensure the best possible information from this valuable planning tool.

In addition, the geographical analysis capabilities of SWIMS allows for a unique perspective. The largest boundary in the study is the County. MAG also maintains socioeconomic and transportation planning databases by Municipal Planning Area (MPA) which indicate the area of planning concern for the jurisdiction and tend to include some unincorporated County areas. A Regional Analysis Zone (RAZ) is an area within an MPA and either can be coterminous with or may be aggregated to form an MPA. A Traffic Analysis Zone (TAZ) represents a subarea within a RAZ and is the smallest geographic unit for which variables are forecast. Finally, Landfill Service Areas (LSA) are used to describe the primary service area for each landfill. These areas are mutually exclusive in the database based on generally recognized areas where wastes are generated for disposal in each respective landfill. In actual service delivery these boundaries may have some overlap.

CASE SCENARIOS

The case scenarios examine the amount of paper material recycled, the amount of waste landfilled, the effect on landfill capacity projected to the year 2020. In addition, information regarding the total financial benefit of recycling revenue and landfill tipping fees avoided is presented. In the scenarios, one category of materials, paper, was selected since information was the most readily available for this category of material. The category is subdivided into three types: mixed paper, cardboard, and newspaper. The case scenarios also concentrated on materials generated from the residential and commercial/industrial waste streams. The case scenarios, developed through the MAG Solid Waste Information Management System (SWIMS) database, were developed for two main reasons. First, the array of scenarios demonstrates the potential conditions of solid waste management in the valley under several different recycling options. Secondly, the scenarios demonstrate the flexibility and usefulness of the system to analyze other scenarios created by MAG member agencies for their use in making management decisions and in understanding their opportunities for solid waste disposal.

There were five scenarios that were developed to demonstrate the possible effects of paper recycling in the valley. Briefly, they contain an analysis of the solid waste picture in the following circumstances:

- Baseline scenario: agencies have no recycling programs in place
- Current Scenario: agencies with curbside recycling continue to recycle at their existing rate
- Enhanced Scenario: agencies with curbside recycling continue to recycle at their existing rate and other MAG member agencies recycle at the metropolitan average rate
- National Scenario: all MAG member agencies reach the 1996 national average by 2005 and recycle at rates above the current national average in the years following
- Potential Scenario: agencies recover all materials possible from the waste stream

All scenarios share a basic set of parameters in order to concentrate on the recycling component of solid waste management. These parameters include:

- Classes of Waste: These scenarios are based on residential and commercial/industrial waste, in essence because these are the two waste streams which comprise most of the recycled materials and the information was the most readily available to the member agencies. SWIMS has the ability to examine waste in four other classes as well: green waste, construction/demolition waste, liquid/semisolid waste, and medical waste.
- Generation Rates: Waste generation rates for residential and commercial/industrial waste were derived from information provided by each member agency. Where the amount of waste generated was not available, the average generation rate for the county, based on the information provided, was used. Generation rates are held constant over the projection horizon.
- Discard Rates: SWIMS is capable of applying discard rates to the waste stream to account for reused goods and reduced waste. However, these scenarios assumed no reused or reduced components of the waste stream. Therefore, discard rates are held constant at 100 percent over the projection horizon.
- Materials: These scenarios concentrated on three paper materials only — mixed

- Component Rates:

paper, cardboard and newspaper. Based on 1996 data, the national waste stream contained approximately 38 percent paper products. Paper products may include more than the three materials identified for the scenarios. A component rate identifies the percent of that material in the waste stream. The component rates for each paper material were based upon the distribution of the paper materials reported by each MAG member agency to the Arizona Department of Environmental Quality (ADEQ) for fiscal year 1997.
- Recovery Rates:

A recovery rate identifies that percentage of the material identified by the component rate (percent of material in waste stream) which actually gets separated from the waste stream for processing. Thus, if 50 percent of possible newspaper discarded gets recovered, the recovery rate is 50 percent. These rates vary by scenario and will be identified as each scenario is described.
- Recycle Rates

A recycle rate identifies that percentage of the material recovered which actually gets recycled. Based on local information provided, this rate was set at 80 percent of MRFs and 100 percent elsewhere. This indicates that a portion of the material recovered is not processed.

Table 1 provides information on the waste generated in Maricopa County for the years 1995 to 2020, in five year intervals. Under all scenarios, the total amount of waste generated is the same. Based on the assumptions above, this amount is also the amount of waste discarded.

Baseline Scenario

The Baseline Scenario assumes the minimum alternative, or that no other solid waste management action is taken except landfilling waste. Therefore, all of the waste that is generated as determined through surveys and interviews with MAG member agencies and private solid waste companies is sent to the landfill. The Baseline Scenario was developed to provide a basis for comparison. Several MAG member communities have recycling programs of various levels in place. The Baseline Scenario allows an understanding of what conditions would be like if no recycling were to take place in the valley. Under the Baseline Scenario, recovery rates are 0 percent for all paper materials for all member agencies.

Current Scenario

The Current Scenario demonstrates, through the model, the most realistic view of today's solid waste management in the valley. This scenario identifies three types of paper products being recycled at the current rate for each MAG member agency that has a curbside recycling program in place. The six jurisdictions in the MAG region that have curbside recycling programs in place are: Chandler, Gilbert, Mesa, Phoenix, Scottsdale and Tempe. Based on information provided by these cities, Table 2 identifies the recovery rates for each of the paper products and Table 3 identifies the estimated materials recycled under the assumptions.

Enhanced Scenario

The Enhanced Scenario infers that all of the MAG member agencies participate in recycling activity at existing regional rates. The scenario assumes that those MAG member agencies that have a curbside recycling programs in place continue recycling at their current rate. In addition, all other MAG member agencies recycle at the metro average rate. Table 4 identifies the recovery rates used in this scenario for each of the paper products and Table 5 identifies the estimated materials recycled under the assumptions.

National Scenario

In general, the current national recycling rate is almost double that of the Arizona rate. However, paper products, which make up a high percentage of the waste stream, are generally recovered at a higher rate than most materials in Arizona. The National Scenario not only includes all MAG member agencies in the recycling activity, but also increases the recovery rate to the existing national average by 2005, and assumes that the rate will continue to rise over time. Table 6 identifies the recovery rates used in this scenario for each of the paper products and for each time period, and Table 7 identifies the estimated materials recycled under the assumptions.

Potential Scenario

The Potential Scenario assumes the maximum alternative, or that all mixed paper, cardboard and newspaper that are present in the waste stream are recovered. The Potential Scenario was developed to provide a basis for comparison with the other scenarios. Therefore, the recovery rates for this scenario are 100 percent for all products and all years. Table 8 identifies the estimated materials recycled under these assumptions.

Landfill Capacity Analysis

One important capability of the MAG Solid Waste Information Management System (SWIMS) is to show the relationship between projected waste quantities and remaining landfill capacities. The Baseline Scenario illustrates this by applying the waste disposal projections against remaining landfill capacity. This analysis can be done for the county as a whole, for a particular municipality, or for a landfill service area. Each of the scenarios attempts to discern impacts that could occur on landfill capacity if waste patterns and practices are assumed over a twenty-five-year period, 1995 to 2020.

Financial Benefit

Recycled materials provide many benefits, both socially and fiscally. The revenue generated by recycling materials and the landfill tipping fees avoided both combine to create a financial benefit to the cities (Figure 1). Further discussion regarding financial benefits is provided in the following section.

SCENARIO COMPARISON

By comparing the recycling scenarios developed with SWIMS, an understanding of possible alternative futures through solid waste management, and the implications of each, are obtained. First, the scenarios will be compared on an annual basis. This will provide information for any given year of activity. Second, the scenarios will be compared on a cumulative basis with the waste patterns and practices assumed over the twenty-five year period.

ALTERNATIVE ANNUAL FUTURES

Figure 2 demonstrates the effect on the amount of materials that go to market by implementing the various scenarios. In the Current Scenario, 184,439 tons of paper materials would be sent to the market for recycling in 2000. This amount has grown by 70 percent by 2020. The Enhanced Scenario, where all jurisdictions participate in recycling, reports 225,755 tons taken to market in 2000. Finally, the Potential Scenario reports 708,131 tons in 2000, almost four times more than the Current Scenario.

It is useful also to examine the amount of waste going to the landfill under the various scenarios (Figure 3). In 2000, the Baseline Scenario indicates that 2.65 million tons would be landfilled. At the state average, \$22.50 per ton, it is projected that almost \$60 million would be spent in landfill tipping fees across the valley. The valley cities that have curbside recycling programs would save \$5.2 million in 2000 in tipping fees according to the Current Scenario. All MAG member agencies could save a total of \$6.35 million if they recycled paper at the existing rate, according to the Enhanced Scenario. Finally, if all paper materials were recovered in 2000, it is projected 886,385 tons would be diverted. This is a savings of \$19.9 million in tipping fees across the valley compared to the Baseline.

ALTERNATIVE CUMULATIVE FUTURES

An examination of the scenarios based on cumulative data provides an understanding of implications over the long-term. Figure 4 demonstrates the cumulative amounts of paper materials sent to market through the year 2020. In 2020, the Current Scenario indicates more than 5.58 million tons will be processed and sold. At 1997 prices, it is projected that over \$258 million in revenues could be obtained (Figure 5). The Enhanced Scenario would generate over \$326 million in revenues through 2020 for valley communities. If all paper materials were recovered by all jurisdictions, almost 22 million tons could be recycled and sold for a total of \$1.03 billion by 2020 according to the Potential Scenario.

Additional funds could be saved through avoiding tipping fees on the tonnage of material that is recycled and not landfilled. Figure 6 graphs the amount of waste going to landfills under the various scenarios. The Baseline Scenario buries over 82 million tons of waste by 2020 in valley landfills. Over the time horizon, this would cost \$1.85 billion in tipping fees using the 1997 state average tipping fee of \$22.50 per ton. In the Current Scenario, the valley jurisdictions with curbside recycling programs in place would generate over \$125 million in tipping fee savings (Figure 7). If all the jurisdictions recycled at the existing rate, \$158 million would be saved in tipping fees across the valley. The Potential Scenario would divert more than 27 million tons in paper material for a savings of over \$493 million in tipping fees. This is a total financial savings of \$1.15 billion over the Baseline Scenario by 2020.

This discussion has demonstrated some of the financial benefits from recycling. In addition, it should be considered that recycling programs also save landfill capacity. This has not been as significant an issue in Arizona as in other states. Nonetheless, some valley landfills will reach capacity in the near future. The cost of closing an existing landfill and siting and constructing a new one would be expensive. Other options, such as transporting waste to a landfill that has adequate capacity, may also require significant expenditures. The scenarios produced through Solid Waste Information Management System (SWIMS) allows for an examination of capacity that could assist in making decisions regarding the landfills that could

service MAG jurisdictions. Figure 8 graphs the capacity remaining at landfills under each scenario. The installation of recycling programs as defined in the scenarios would have the effect of extending the life of several existing landfills by a few years. With the implementation of the Potential Scenario, capacity remaining will increase to over 113 million cubic yards, compared to the 67.9 million cubic yards under the Baseline Scenario.

CONCLUSION

The Solid Waste Information Management System (SWIMS) is designed to examine factors that contribute to waste management and model their impacts on the waste stream. As the interest in recycling programs grows, communities will be increasingly looking for opportunities to establish and maintain the most cost effective and efficient programs. The SWIMS database allows communities to explore their options for proper solid waste management on a regional and local basis through evaluating various scenarios. The SWIMS system and several case scenarios that are presented in this document demonstrate the opportunities available to MAG member agencies to investigate different methods for managing solid waste.

Table 1

**Total Waste Generated by Year and Municipal Planning Area
(Tons)**

Municipal Planning Area	1995	2000	2005	2010	2015	2020
Avondale	12,327	17,512	20,343	26,584	36,932	52,775
Buckeye	6,923	11,938	21,744	28,180	51,739	74,012
Carefree	1,953	2,250	2,528	3,137	3,389	3,629
Cave Creek	2,165	2,727	3,714	4,927	5,881	6,694
Chandler	84,234	113,687	138,256	162,462	179,504	203,883
El Mirage	3,031	3,589	4,296	5,117	5,768	7,192
Fountain Hills	8,168	10,507	14,070	18,911	27,629	29,341
Gila Bend	1,231	1,368	1,506	1,579	1,671	1,888
Gila River Indian Comm.	3,048	3,621	4,235	5,111	8,552	11,989
Gilbert	37,716	56,560	77,801	101,432	122,377	141,758
Glendale	145,923	171,930	192,146	213,813	234,214	249,834
Goodyear	8,466	15,752	22,917	31,066	44,665	67,748
Guadalupe	2,586	2,912	3,127	3,153	3,161	3,163
Litchfield Park	2,439	3,344	4,295	5,428	7,477	8,497
Maricopa County	46,306	52,538	60,098	64,742	71,903	88,000
Mesa	234,192	275,991	312,215	353,439	377,070	401,504
Paradise Valley	12,815	13,422	13,453	13,478	13,496	13,513
Peoria	41,993	52,679	70,531	85,589	99,549	111,421
Phoenix	877,064	979,170	1,054,469	1,135,204	1,205,210	1,274,642
Queen Creek	6,512	9,371	13,489	19,431	23,776	28,206
Salt River PMIC	4,383	4,689	4,767	5,250	5,596	5,947
Scottsdale	106,841	127,272	147,885	164,629	178,266	188,691
Surprise	5,627	10,678	17,024	19,891	23,574	28,981
Tempe	150,047	164,112	173,441	182,416	190,483	196,759
Tolleson	4,019	4,313	4,900	6,833	7,448	8,073
Wickenburg	6,653	7,281	7,778	8,388	8,893	9,372
Youngtown	2,745	2,795	2,835	2,886	2,941	2,994
Total Waste	1,819,406	2,122,009	2,393,865	2,673,075	2,941,162	3,220,506

Current Scenario
Current Agencies with Curbside Recycling
Recovery Rates for Paper Materials

Table 2

Municipal Planning Area	Cardboard	Newspaper	Mixed Paper
Avondale	0.00%	0.00%	0.00%
Buckeye	0.00%	0.00%	0.00%
Carefree	0.00%	0.00%	0.00%
Cave Creek	0.00%	0.00%	0.00%
Chandler	30.01%	47.74%	30.04%
El Mirage	0.00%	0.00%	0.00%
Fountain Hills	0.00%	0.00%	0.00%
Gila Bend	0.00%	0.00%	0.00%
Gila River Indian Community	0.00%	0.00%	0.00%
Gilbert	46.27%	46.27%	46.27%
Glendale	0.00%	0.00%	0.00%
Goodyear	0.00%	0.00%	0.00%
Guadalupe	0.00%	0.00%	0.00%
Litchfield Park	0.00%	0.00%	0.00%
Maricopa County	0.00%	0.00%	0.00%
Mesa	21.52%	21.52%	21.52%
Paradise Valley	0.00%	0.00%	0.00%
Peoria	0.00%	0.00%	0.00%
Phoenix	26.84%	26.84%	26.84%
Queen Creek	0.00%	0.00%	0.00%
Salt River Pima-Maricopa Indian Community	0.00%	0.00%	0.00%
Scottsdale	54.92%	54.92%	54.92%
Surprise	0.00%	0.00%	0.00%
Tempe	51.35%	51.35%	51.35%
Tolleson	0.00%	0.00%	0.00%
Wickenburg	0.00%	0.00%	0.00%
Youngtown	0.00%	0.00%	0.00%

Table 3

Current - Curbside Recycling for Current Agencies
Total Materials to Marketplace by Year and Municipal Planning Area
(Tons)

Municipal Planning Area	1995	2000	2005	2010	2015	2020
Chandler	11,574	15,804	19,326	22,865	25,320	28,959
Gilbert	5,834	8,623	12,062	15,707	19,064	21,942
Mesa	16,314	19,329	21,873	24,783	26,509	28,308
Phoenix	79,180	88,312	94,948	102,036	108,041	114,018
Scottsdale	19,535	23,204	26,895	29,921	32,383	34,354
Tempe	26,623	29,167	30,881	32,556	34,019	35,204
Total Materials	159,060	184,439	205,985	227,868	245,337	262,785
Total Revenues	\$7,377,076	\$8,546,350	\$9,537,538	\$10,542,661	\$11,343,251	\$12,141,204
Total Tipping Fees Avoided	\$3,578,839	\$4,149,884	\$4,634,655	\$5,127,030	\$5,520,076	\$5,912,652

**Enhanced Scenario
Curbside Recycling for All Agencies
Recovery Rates for Paper Materials**

Table 4

Municipal Planning Area	Rate for Cardboard	Rate for Newspaper	Rate for Mixed Paper
Avondale	30.13%	31.22%	30.04%
Buckeye	30.13%	31.22%	30.04%
Carefree	30.13%	31.22%	30.04%
Cave Creek	30.13%	31.22%	30.04%
Chandler	30.01%	47.74%	30.04%
El Mirage	30.13%	31.22%	30.04%
Fountain Hills	30.13%	31.22%	30.04%
Gila Bend	30.13%	31.22%	30.04%
Gila River Indian Community	30.13%	31.22%	30.04%
Gilbert	46.27%	46.27%	46.27%
Glendale	30.13%	31.22%	30.04%
Goodyear	30.13%	31.22%	30.04%
Guadalupe	30.13%	31.22%	30.04%
Litchfield Park	30.13%	31.22%	30.04%
Maricopa County	30.13%	31.22%	30.04%
Mesa	21.52%	21.52%	21.52%
Paradise Valley	30.13%	31.22%	30.04%
Peoria	30.13%	31.22%	30.04%
Phoenix	26.84%	26.84%	26.84%
Queen Creek	30.13%	31.22%	30.04%
Salt River Pima-Maricopa Indian Community	30.13%	31.22%	30.04%
Scottsdale	54.92%	54.92%	54.92%
Surprise	30.13%	31.22%	30.04%
Tempe	51.35%	51.35%	51.35%
Tolleson	30.13%	31.22%	30.04%
Wickenburg	30.13%	31.22%	30.04%
Youngtown	30.13%	31.22%	30.04%

Table 5

Enhanced - Curbside Recycling for All Agencies
Total Materials to Marketplace by Year and Municipal Planning Area
(Tons)

Municipal Planning Area	1995	2000	2005	2010	2015	2020
Avondale	1,203	1,755	2,051	2,732	3,798	5,317
Buckeye	698	1,214	2,320	3,015	5,538	7,831
Carefree	206	234	261	320	346	370
Cave Creek	222	277	371	485	575	656
Chandler	11,574	15,804	19,326	22,865	25,320	28,959
El Mirage	297	361	443	539	614	768
Fountain Hills	814	1,040	1,385	1,862	2,700	2,879
Gila Bend	121	135	150	157	166	189
Gila River Indian Comm.	330	397	468	570	973	1,374
Gilbert	5,834	8,623	12,062	15,707	19,064	21,942
Glendale	15,185	17,946	20,108	22,410	24,520	26,178
Goodyear	818	1,549	2,259	3,064	4,355	6,537
Guadalupe	249	285	308	311	312	312
Litchfield Park	248	342	437	550	748	845
Maricopa County	4,621	5,228	6,005	6,461	7,147	8,730
Mesa	16,314	19,329	21,873	24,783	26,509	28,308
Paradise Valley	1,263	1,321	1,324	1,326	1,328	1,330
Peoria	4,282	5,386	7,203	8,844	10,260	11,513
Phoenix	79,180	88,312	94,948	102,036	108,041	114,018
Queen Creek	628	903	1,299	1,908	2,331	2,763
Salt River PMIC	454	489	497	553	592	630
Scottsdale	19,535	23,204	26,895	29,921	32,383	34,354
Surprise	553	1,042	1,700	2,004	2,388	2,914
Tempe	26,623	29,167	30,881	32,556	34,019	35,204
Tolleson	392	422	486	671	731	792
Wickenburg	645	708	758	820	869	917
Youngtown	280	285	288	293	298	304
Total Materials	192,567	225,755	256,106	286,764	315,926	345,934
Total Revenues	\$8,938,053	\$10,471,117	\$11,872,516	\$13,286,399	\$14,631,776	\$16,014,857
Total Tipping Fees Avoided	\$4,332,749	\$5,079,495	\$5,762,385	\$6,452,180	\$7,108,344	\$7,783,521

National Scenario
Recycling for All Agencies, Rising to National Average
Recovery Rates for Paper Materials

Table 6

Municipal Planning Area	1995			2000			2005		
	Cardboard	Newspaper	Mixed Paper	Cardboard	Newspaper	Mixed Paper	Cardboard	Newspaper	Mixed Paper
JURISDICTION									
Avondale	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Buckeye	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Carefree	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Cave Creek	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Chandler	30.01%	47.74%	30.04%	30.13%	47.74%	30.04%	40.80%	47.74%	40.80%
El Mirage	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Fountain Hills	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Gila Bend	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Gila River Indian Community	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Gilbert	46.27%	46.27%	46.27%	46.27%	46.27%	46.27%	46.27%	46.27%	46.27%
Glendale	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Goodyear	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Guadalupe	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Litchfield Park	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Maricopa County	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Mesa	21.52%	21.52%	21.52%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Paradise Valley	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Peoria	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Phoenix	26.84%	26.84%	26.84%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Queen Creek	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Salt River Pima-Maricopa Indian Community	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Scottsdale	54.92%	54.92%	54.92%	54.92%	54.92%	54.92%	54.92%	54.92%	54.92%
Surprise	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Tempe	51.35%	51.35%	51.35%	51.35%	51.35%	51.35%	51.35%	51.35%	51.35%
Tolleson	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Wickenburg	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%
Youngtown	0.00%	0.00%	0.00%	30.13%	31.22%	30.04%	40.80%	40.80%	40.80%

National Scenario
Recycling for All Agencies, Rising to National Average
Recovery Rates for Paper Materials

Table 6

Municipal Planning Area	2010			2015			2020		
	Cardboard	Newspaper	Mixed Paper	Cardboard	Newspaper	Mixed Paper	Cardboard	Newspaper	Mixed Paper
JURISDICTION									
Avondale	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Buckeye	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Carefree	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Cave Creek	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Chandler	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
El Mirage	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Fountain Hills	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Gila Bend	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Gila River Indian Community	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Gilbert	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Glendale	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Goodyear	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Guadalupe	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Litchfield Park	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Maricopa County	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Mesa	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Paradise Valley	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Peoria	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Phoenix	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Queen Creek	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Salt River Pima-Maricopa Indian Community	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Scottsdale	54.92%	54.92%	54.92%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Surprise	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Tempe	51.47%	51.35%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Tolleson	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Wickenburg	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%
Youngtown	51.47%	50.38%	51.56%	62.13%	59.95%	62.32%	72.80%	69.53%	73.08%

Table 7

National - Recycling for All Agencies, Rising to National Average
Total Materials to Marketplace by Year and Municipal Planning Area
(Tons)

Municipal Planning Area	1995	2000	2005	2010	2015	2020
Avondale	0	1,755	2,713	4,495	7,473	12,178
Buckeye	0	1,214	3,068	4,960	10,897	17,936
Carefree	0	234	345	527	681	848
Cave Creek	0	277	491	799	1,131	1,502
Chandler	11,574	15,810	20,942	27,650	36,618	48,748
El Mirage	0	361	586	887	1,208	1,760
Fountain Hills	0	1,040	1,832	3,064	5,314	6,594
Gila Bend	0	135	198	258	326	433
Gila River Indian Comm.	0	397	619	939	1,914	3,147
Gilbert	5,834	8,623	12,062	17,180	24,890	33,300
Glendale	0	17,946	26,596	36,871	48,246	59,956
Goodyear	0	1,549	2,987	5,041	8,570	14,972
Guadalupe	0	285	408	512	613	715
Litchfield Park	0	342	578	904	1,471	1,936
Maricopa County	0	5,228	7,943	10,630	14,063	19,993
Mesa	16,314	27,669	41,469	58,497	74,872	93,099
Paradise Valley	0	1,321	1,751	2,182	2,613	3,045
Peoria	0	5,386	9,527	14,551	20,188	26,368
Phoenix	79,180	101,433	144,333	193,018	244,489	300,377
Queen Creek	0	903	1,718	3,139	4,587	6,328
Salt River PMIC	0	489	657	909	1,165	1,444
Scottsdale	19,535	23,204	26,895	29,921	35,890	44,352
Surprise	0	1,042	2,249	3,298	4,699	6,674
Tempe	26,623	29,167	30,881	32,573	39,996	48,101
Tolleson	0	422	642	1,105	1,439	1,814
Wickenburg	0	708	1,002	1,349	1,711	2,100
Youngtown	0	285	382	482	587	695
Total Materials	159,060	247,222	342,874	455,739	595,651	758,414
Total Revenues	\$7,377,076	\$11,456,394	\$16,054,247	\$21,476,072	\$28,141,119	\$35,890,922
Total Tipping Fees Avoided	\$3,578,839	\$5,562,493	\$7,714,654	\$10,254,119	\$13,402,152	\$17,064,319

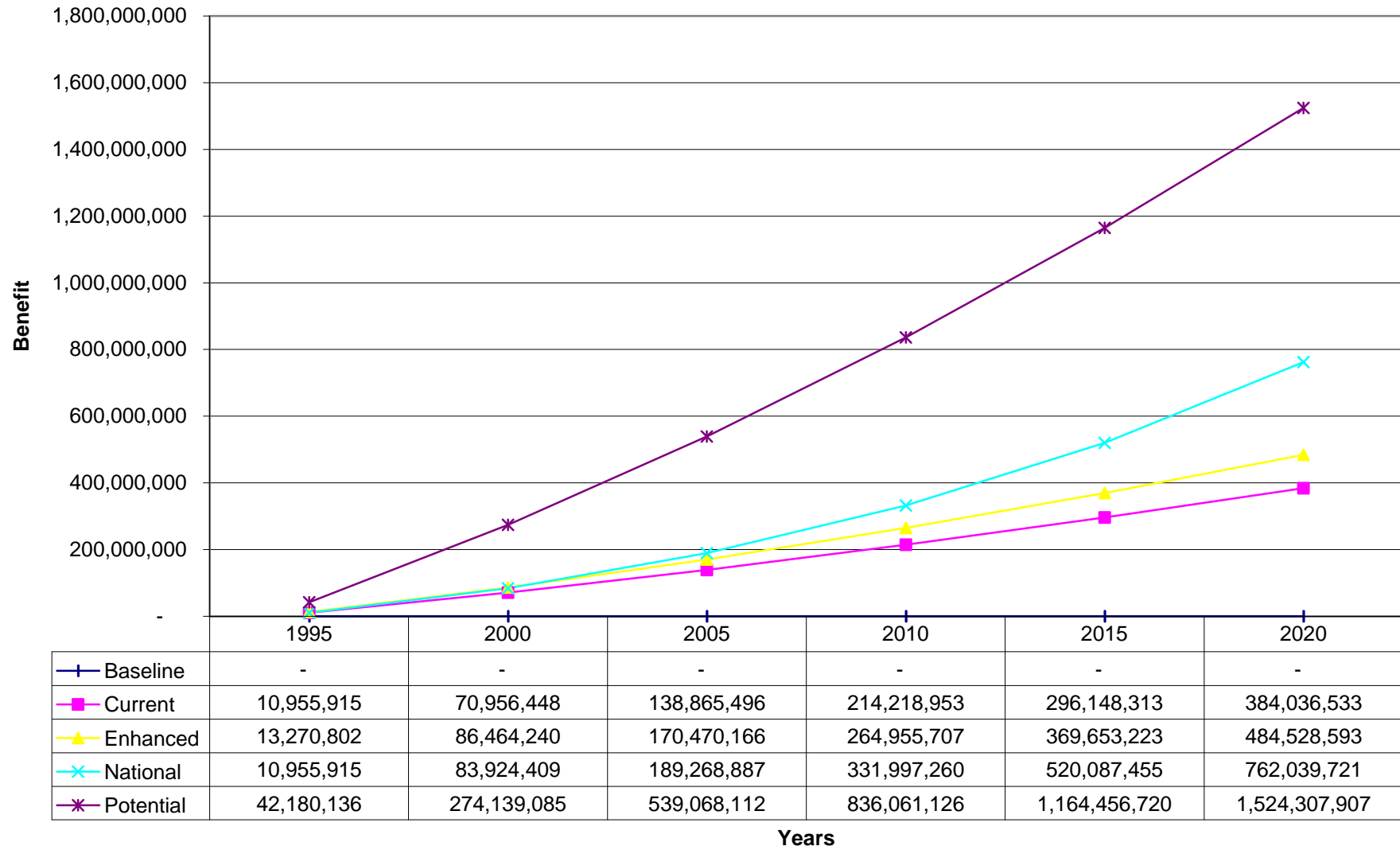
Table 8

Potential - Full Recycling Recovery Rate of 100% from 1995
Total Materials to Marketplace by Year and Municipal Planning Area
(Tons)

Municipal Planning Area	1995	2000	2005	2010	2015	2020
Avondale	3,901	5,688	6,649	8,856	12,313	17,237
Buckeye	2,262	3,937	7,520	9,773	17,952	25,387
Carefree	667	758	847	1,039	1,121	1,200
Cave Creek	721	897	1,203	1,574	1,864	2,126
Chandler	27,577	37,656	46,048	54,480	60,330	69,000
El Mirage	963	1,170	1,436	1,747	1,990	2,491
Fountain Hills	2,638	3,373	4,490	6,037	8,754	9,334
Gila Bend	391	438	485	508	537	613
Gila River Indian Comm.	1,071	1,287	1,518	1,849	3,153	4,454
Gilbert	12,609	18,636	26,068	33,945	41,202	47,423
Glendale	49,225	58,175	65,186	72,648	79,487	84,863
Goodyear	2,650	5,020	7,322	9,933	14,119	21,192
Guadalupe	806	924	1,000	1,008	1,011	1,012
Litchfield Park	804	1,109	1,416	1,782	2,424	2,741
Maricopa County	14,981	16,947	19,467	20,944	23,170	28,299
Mesa	75,806	89,819	101,639	115,164	123,184	131,541
Paradise Valley	4,093	4,283	4,292	4,300	4,305	4,310
Peoria	13,881	17,461	23,351	28,670	33,261	37,322
Phoenix	295,007	329,031	353,756	380,163	402,538	424,806
Queen Creek	2,036	2,928	4,210	6,184	7,557	8,957
Salt River PMIC	1,471	1,584	1,610	1,792	1,919	2,043
Scottsdale	35,569	42,250	48,971	54,481	58,964	62,552
Surprise	1,792	3,376	5,512	6,498	7,741	9,446
Tempe	51,847	56,801	60,139	63,401	66,249	68,557
Tolleson	1,270	1,367	1,574	2,176	2,371	2,568
Wickenburg	2,092	2,294	2,457	2,658	2,819	2,972
Youngtown	907	923	935	951	968	984
Total Materials	607,037	708,131	799,102	892,560	981,301	1,073,430
Total Revenues	\$28,521,795	\$33,266,622	\$37,530,171	\$41,908,423	\$46,058,565	\$50,372,991
Total Tipping Fees Avoided	\$13,658,341	\$15,932,936	\$17,979,799	\$20,082,601	\$22,079,284	\$24,152,173

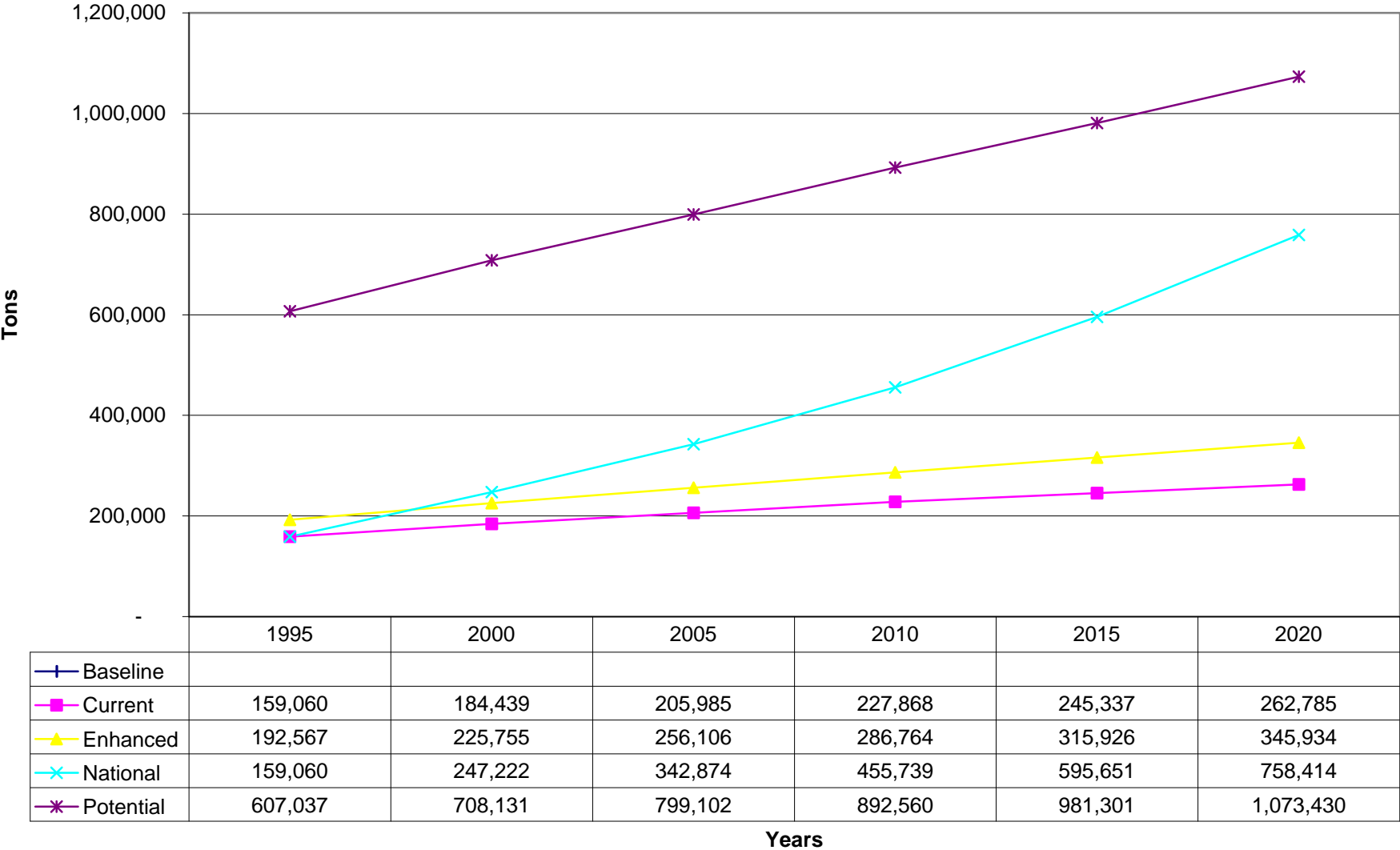
Total Financial Benefit

Figure 1



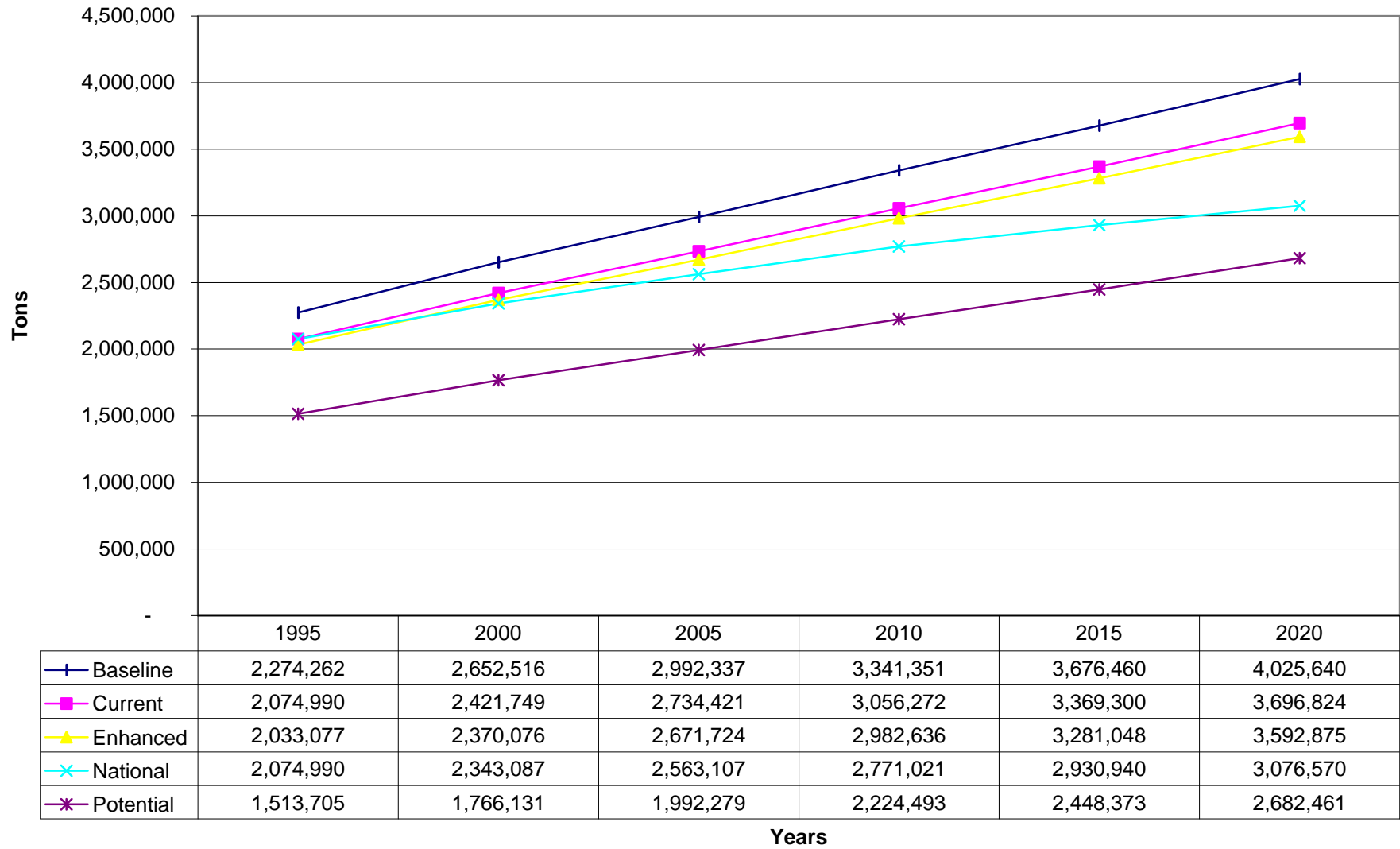
Paper Materials to Market (Annual)

Figure 2



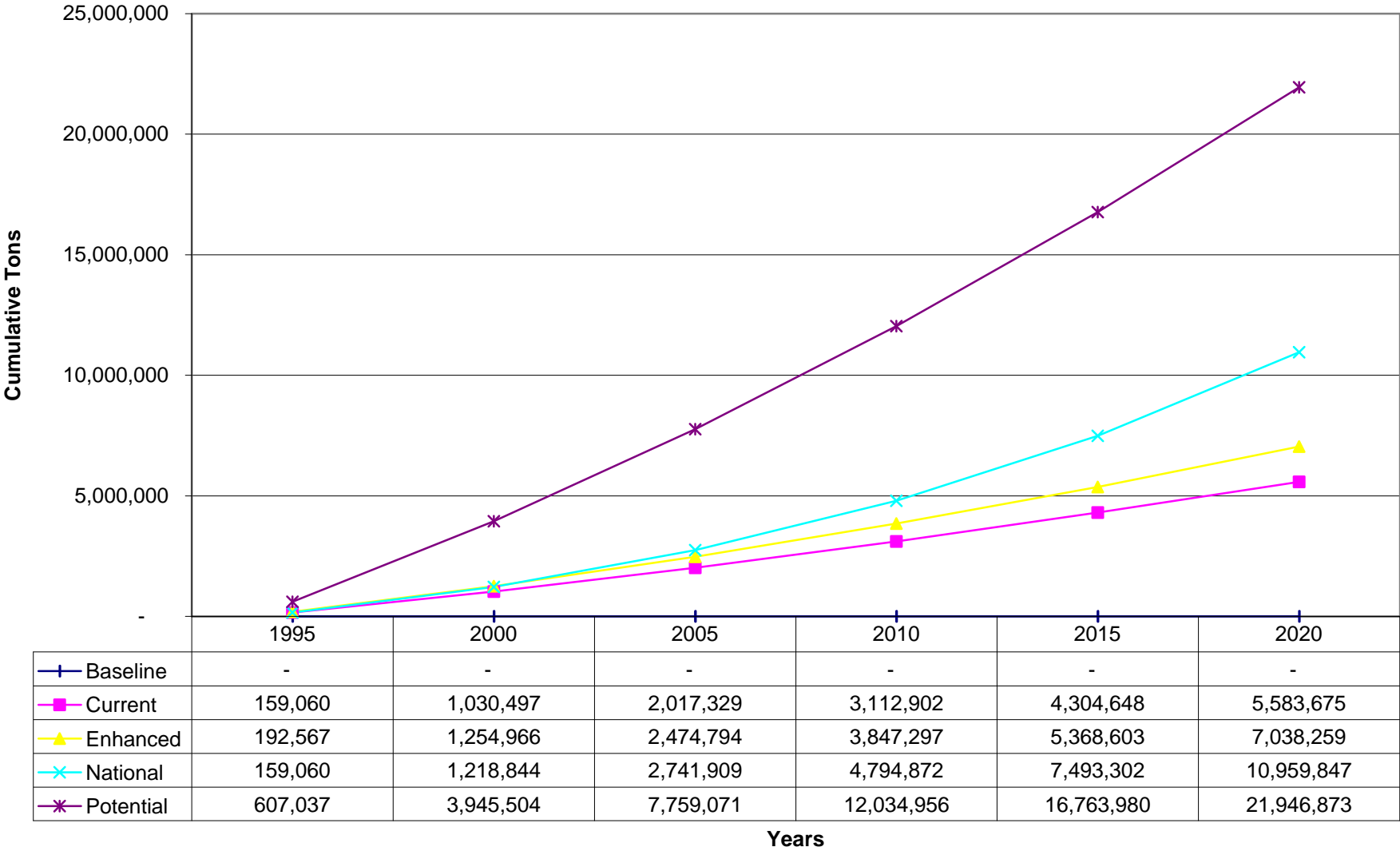
Waste to Landfill (Annual)

Figure 3



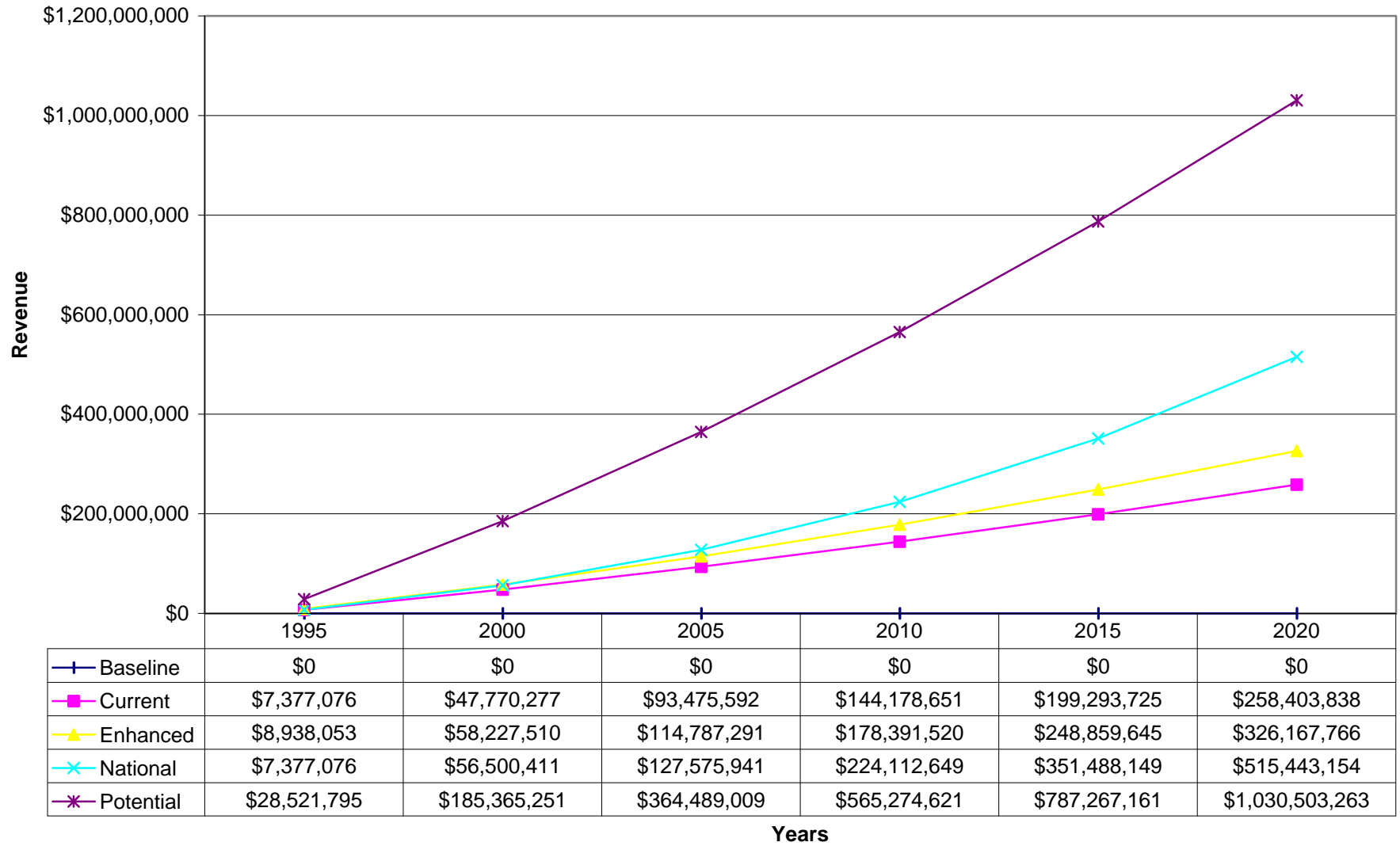
Paper Materials to Market

Figure 4



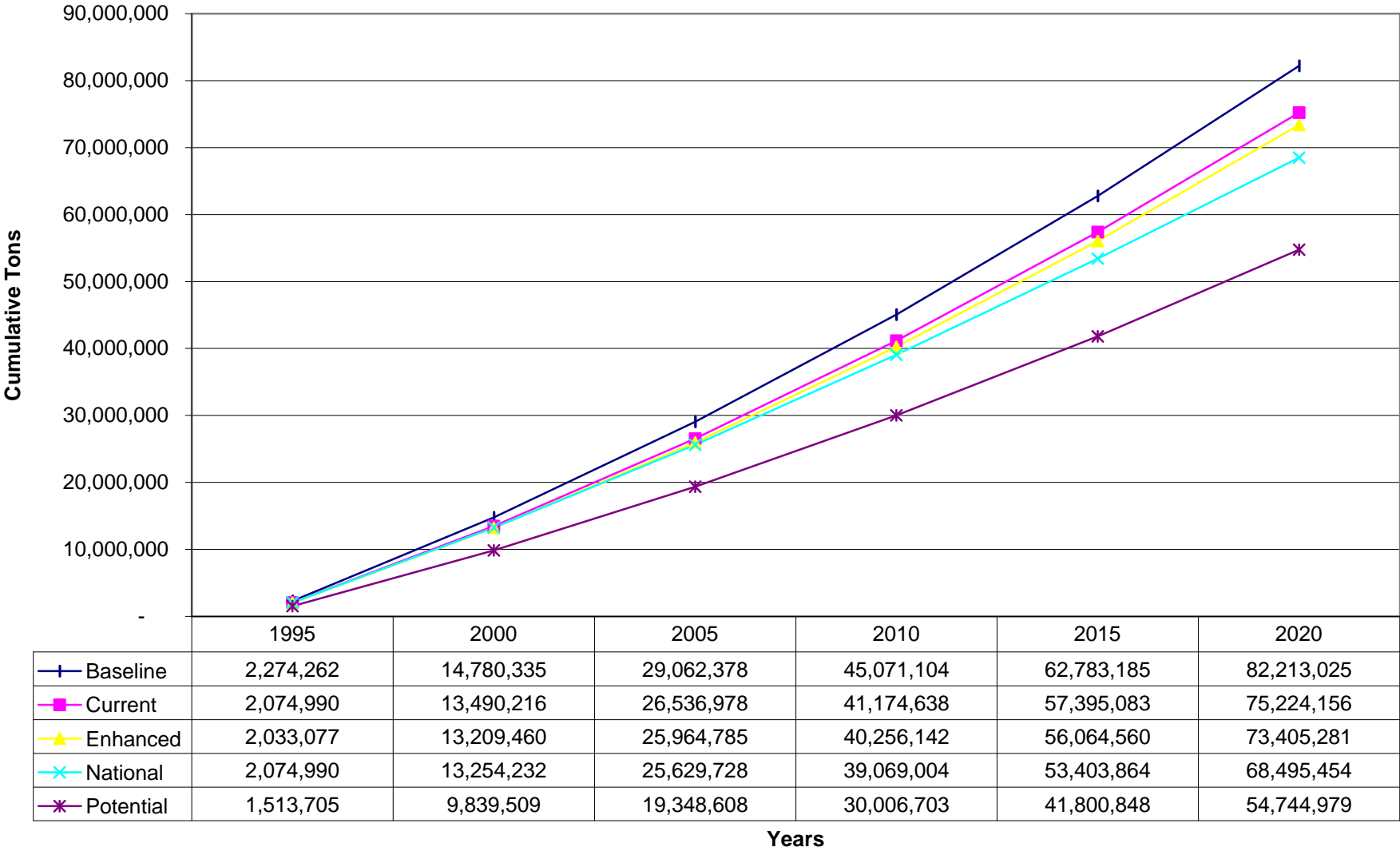
Revenue Earned

Figure 5



Waste to Landfills

Figure 6



Tipping Fees Avoided

Figure 7



Capacity Remaining at Landfills

Figure 8

